

Claims

- [c1] An imaging system comprising:
 - A primary gradient coil assembly; and
 - A shield coil assembly connected in series to said primary gradient coil assembly, said shield coil assembly comprising:
 - a first gradient shield coil; and
 - a second gradient shield coil connected in parallel to said first gradient shield coil.
- [c2] An imaging system as in claim 1 further comprising at least one additional gradient shield coil connected in parallel to said first gradient shield coil and said second gradient shield coil.
- [c3] An imaging system as in claim 1 wherein said first gradient shield coil has a resistance equal to said second gradient shield coil.
- [c4] An imaging system as in claim 1 wherein:
 - said first gradient shield coil comprises a plurality of first shield winding turns; and
 - said second gradient shield coil comprises a plurality of second shield winding turns, said plurality of second shield winding turns having the same number of turns as said plurality of first shield winding turns.
- [c5] An imaging system as in claim 1 wherein:

said first gradient shield coil comprises a plurality of first shield winding turns and a plurality of winding gaps, each of said plurality of winding gaps formed between consecutive turns of said plurality of first shield winding turns; and
said second gradient shield coil comprises a plurality of second shield winding turns, each of said plurality of second shield winding turns positioned within one of said winding gaps.

- [c6] An imaging system as in claim 5 wherein said plurality of first shield winding turns and said plurality of second shield winding turns are positioned within a single winding plane.
- [c7] An imaging system as in claim 1 wherein said shield coil assembly comprises a plurality of winding turns formed in an asymmetrical pattern.
- [c8] An imaging system as in claim 1 wherein:
said first gradient shield coil comprises a plurality of first shield winding turns forming a first sub-coil;
said second gradient shield coil comprises a plurality of second shield winding turns forming a second sub-coil, said second sub-coil positioned linearly adjacent to said first sub-coil and positioned within a single winding plane.
- [c9] An imaging system comprising:
A primary gradient coil assembly; and
A shield coil assembly surrounding said primary gradient coil

assembly, said shield coil assembly comprising:
a first gradient shield coil; and
a second gradient shield coil connected in parallel to said first
gradient shield coil.

- [c10] An imaging system as in claim 9 further comprising at least one additional gradient shield coil connected in parallel to said first gradient shield coil and said second gradient shield coil.
- [c11] An imaging system as in claim 9 wherein said first gradient shield coil has a resistance equal to said second gradient shield coil.
- [c12] An imaging system as in claim 9 wherein:
said first gradient shield coil comprises a plurality of first shield winding turns; and
said second gradient shield coil comprises a plurality of second shield winding turns, said plurality of second shield winding turns having the same number of turns as said plurality of first shield winding turns.
- [c13] An imaging system as in claim 9 wherein:
said first gradient shield coil comprises a plurality of first shield winding turns and a plurality of winding gaps, each of said plurality of winding gaps formed between consecutive turns of said plurality of first shield winding turns; and

said second gradient shield coil comprises a plurality of second shield winding turns, each of said plurality of second shield winding turns positioned within one of said winding gaps.

- [c14] An imaging system as in claim 9 wherein:
 - said first gradient shield coil comprises a plurality of first shield winding turns forming a first sub-coil;
 - said second gradient shield coil comprises a plurality of second shield winding turns forming a second sub-coil, said second sub-coil positioned linearly adjacent to said first sub-coil and positioned within a single winding plane.
- [c15] An imaging system as in claim 13 wherein said plurality of first shield winding turns and said plurality of second shield winding turns are positioned within a single winding plane.
- [c16] An imaging system as in claim 9 wherein said shield coil assembly comprises a plurality of winding turns formed in an asymmetrical pattern.
- [c17] A method of reducing the fringe field generated by a primary gradient coil assembly comprising:
 - running a first current through a first gradient shield coil connected in parallel to the primary gradient coil assembly;
 - and
 - running a second current through a second gradient shield coil connected in series to the primary gradient coil assembly, said

second gradient shield coil connected in parallel to said first gradient shield coil.

- [c18] A method as described in claim 17, wherein said first current is equal to said second current.
- [c19] A method as described in claim 17, further comprising:
adjusting said first current and said second current independently to minimize the fringe field.
- [c20] A method as described in claim 17, wherein said first current and said second current are passed through an equal number of winding turns.
- [c21] A method as described in claim 17, wherein said first gradient shield coil and said second gradient shield coil share a single winding plane.